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(71) Applicant (for all designated States except US): **E.I. DU PONT DE NEMOURS AND COMPANY** [US/US]; 1007 Market Street, Wilmington, DE 19898 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **NAPPA, Mario,**

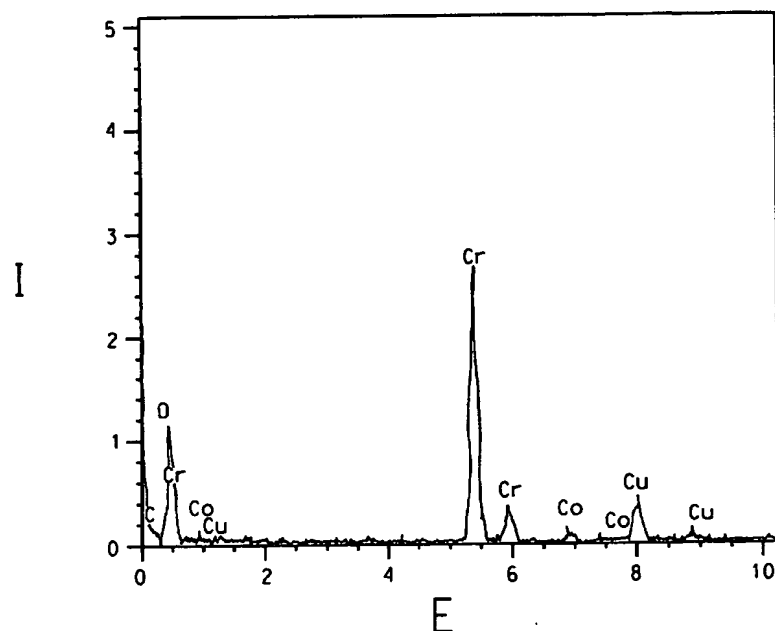
J. [US/US]; 3 Oakridge Court, Newark, DE 19711 (US). **RAO, Velliyur, Nott, Mallikarjuna** [US/US]; 1 Georgetown Avenue, Wilmington, DE 19809 (US). **ROSENFELD, David, H.** [US/US]; 1927 Susquehannock Drive, Drumore, PA 17518 (US). **SUBRAMONEY, Shekhar** [IN/US]; 425 Stella Drive, Hockessin, DE 19707 (US). **SUBRAMANIAN, Munirpallam, A.** [US/US]; 20 Pratt Lane, Kennett Square, PA 19348 (US). **SIEVERT, Allen, C.** [US/US]; 215 Rhett Lane, Elkton, MD 21921 (US).

(74) Agent: **HEISER, David, E.**; E.I. Du Pont De Nemours And Company, Legal Patent Records Center, 4417 Lancaster Pike, Wilmington, DE 19805 (US).

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(54) Title: COBALT-SUBSTITUTED CHROMIUM OXIDE COMPOSITIONS, THEIR PREPARATION, AND THEIR USE AS CATALYSTS AND CATALYST PRECURSORS



(57) Abstract: A crystalline alpha-chromium oxide where from about 0.05 atom % to about 6 atom % of the chromium atoms in the alpha-chromium oxide lattice are replaced by trivalent cobalt (Co^{3+}) atoms is disclosed. Also disclosed is a chromium-containing catalyst composition comprising as a chromium-containing component the crystalline cobalt-substituted alpha-chromium oxide; and a method for preparing a composition comprising the crystalline cobalt-substituted alpha-chromium oxide. The method involves (a) co-precipitating a solid by adding ammonium hydroxide to an aqueous solution of a soluble cobalt salt and a soluble trivalent chromium salt that contains at least three moles of nitrate per mole of chromium in the solution and has a cobalt concentration of from about 0.05 mole % to about 6 mole % of the total concentration of cobalt and chromium in the solution; and after at least three moles of ammonium per mole of chromium in the solution has been added to the solution, (b)

collecting the co-precipitated solid formed in (a); (c) drying the collected solid; and (d) calcining the dried solid. Also disclosed is a chromium-containing catalyst composition comprising a chromium-containing component prepared by treating the crystalline cobalt-substituted alpha-chromium oxide with a fluorinating agent; and a process for changing the fluorine distribution (i.e., content and/or arrangement) in a hydrocarbon or halogenated hydrocarbon in the presence of a catalyst. The process involves using as the catalyst a composition comprising the crystalline cobalt-substituted alpha-chromium oxide and/or the treated cobalt-substituted alpha-chromium oxide.



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